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The Immature Stages of *Arctoonopa carbonipes* (Alex.)

(Diptera : Tipulidae)¹

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Recent collections of the immature stages of certain species of crane flies along the Nooksack River in northern Washington, resulted in the discovery of the larval and pupal stages of *Arctoonopa carbonipes* (Alex.).

The immature stages were found in a seepage area with a substrate of fine sand mixed with leaf debris and silt. Of six larvae collected, two were preserved, three died in rearing cages and were then preserved, and one was reared through the pupal stage. Just prior to emergence, the pupa died. However, the genitalia of the developing adult within the pupa had sufficiently matured so that Dr. C. P. Alexander could give a specific identification to the specimens concerned. Because of the scarcity of specimens, the following descriptions are based on five larvae and two pupae. The description of the head capsule is based on one specimen.

ARCTOONOPA CARBONIPES (Alexander)

Last Instar Larva.—Length 14.0–14.5 mm; dorsoventral and dextrosinistral diameters both 0.6–0.7 mm. Body elongate, cylindrical, with numerous golden setae closely appressed to integument. Chaetotaxy reduced or absent in many segments. Spiracular disk with five fleshy lobes; dorsal lobe with heavily sclerotized, thick, and elongate spine which turns ventrally, ending parallel to surface of disk, length spine subequal to length of dorsal lobe; darkened area, with four to six spines at outer margin between each fleshy lobe, central spine larger and darker than those on either side. Spiracles with reddish-brown centers, outer rims whitish-yellow. Remainder of markings on disk black (fig. 1). Anal gills expanded at bases, extending laterally to blunt, fleshy point. Head capsule narrow anteriorly, wider posteriorly, greatest width occurring at about three-quarters of head capsule length, length 0.708 mm; dextrosinistral diameter at mandible 0.187 mm, dorsoventral diameter at mandible 0.126 mm; clypeal area slightly sclerotized with two small indentations on caudal margin; frontal area membranous; antennal buttress sclerotized, curves medially becoming less sclerotized at antennal bases; post-antennal buttress sclerotized continuing back to junction of dorsal and dorsolateral

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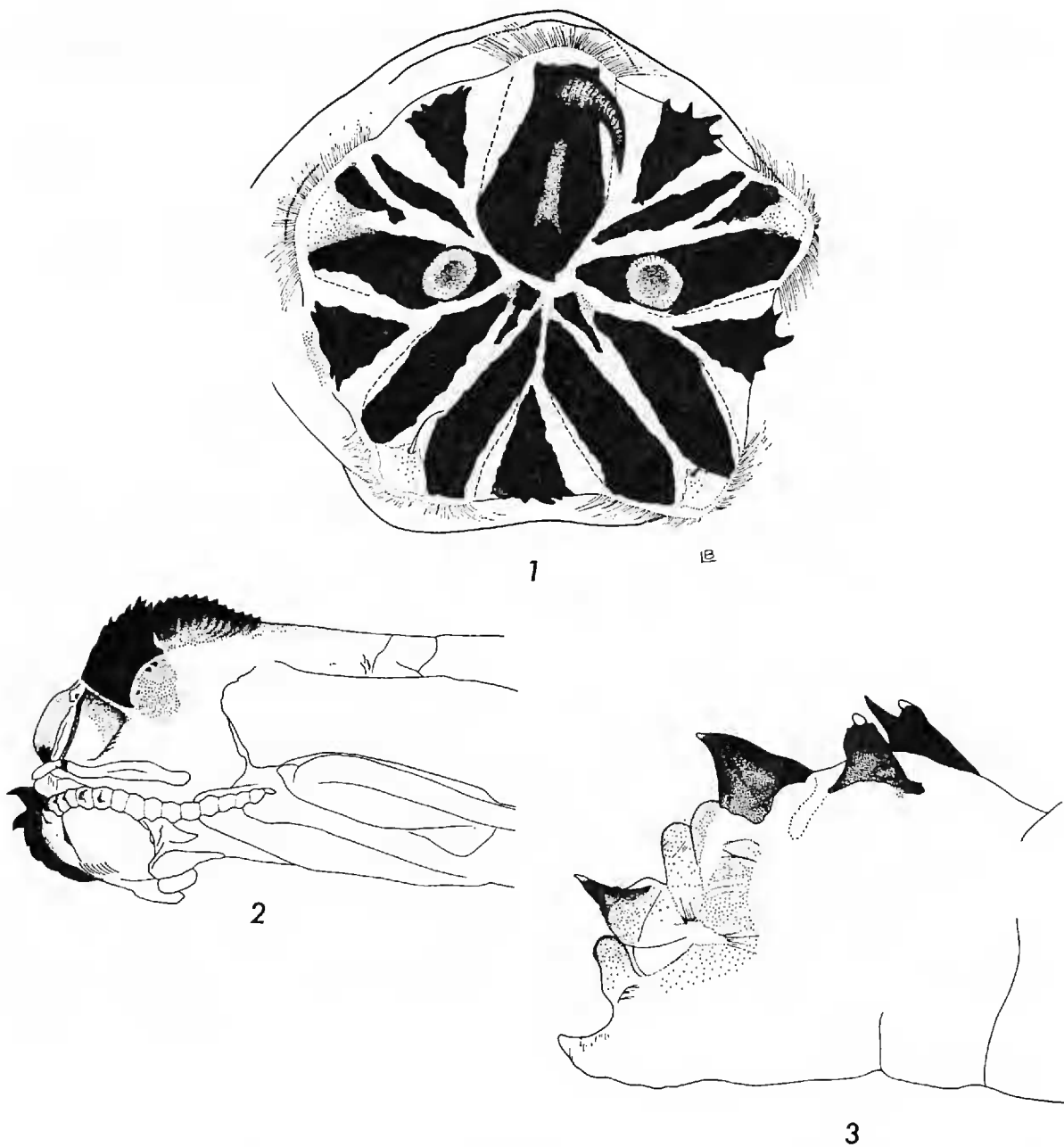


FIG. 1. Spiracular disk of *A. carbonipes* (three-quarter view). FIG. 2. Lateral view of pupal head region of *A. carbonipes*. FIG. 3. Lateral view of male cauda of *A. carbonipes*.

bars, which are much darker and more heavily sclerotized; dorsal bars are longest posterior extensions of head capsule, dorsolateral bars spatulate caudally, ending just before caudal tips of dorsal bars, caudal margins of ventral (maxillary) bars ending short distance anterior to those of the dorsolateral bars, ventral bars greatly spatulate at posterior ends; lateral area between posterior mandibular articulation and ventral bar heavily sclerotized; ocular plate membranous except for sclerotized area just anterior to premaxillary suture; maxillary plate not toothed.

Pupa.—Length 6.8–8.3 mm; dextrosinistral diameters at base of wing pads both 0.9 mm. Sheaths of labial palps not curved, armed with small spine at tips, haustellar sheaths forming small triangular area on either side of facial point, eye sheath with spine at middle of cephalic margin, antennal sheath with blunt, laterally directed spine both basally and distally on scape, pedicle and flagellar

segments with dorsolateral spines between anterior and posterior margins of segments, with spines becoming progressively smaller to flagellar tip; cephalic crest with two blunt nodes occurring at either side of midline. Central anterior area of mesonotum surrounded by raised, rugose ridge forming just below mesonotal breathing horns and sweeping cephalad to base of pronotal spines (fig. 2); median carina blunt and slightly sclerotized to level of the pseudosuture, medial area above the pseudosuture abruptly and broadly white with white area narrowing and continuing to posterior margin of mesonotum as a thin line; lateral areas of dorsal crest heavily ridged with patch of short spines arising on either side of midline; heavily sclerotized ridges formed from dorsal crest to about midlength of mesonotal surface; lateral carina slightly raised from surface of pupal case. Mesonotal breathing horns with globular, black bases, entire horn short and stubby. Leg sheaths end near posterior margins of third abdominal segment; male and female pupal cauda with dorsal area having five heavily sclerotized tubercles, which are homologous with the larval spiracular lobes, and bearing small sclerotized spine, directly caudally at each tip. Dorsal tubercle in addition with small caudal point (fig. 3).

The body form and structures described above for the genus *Arctoconopa* illustrate a close affinity to *Psiloconopa*. The closeness of this relationship is also indicated by the taxonomic history of the group. *Arctoconopa carbonipes* was originally described from the adult stage as a member of the genus *Erioptera* (Alexander, 1929) and later placed in *Psiloconopa*, considered by Alexander (1949) as a subgenus. This evidence supports Alexander in his regarding *Arctoconopa* as a valid genus (Alexander, 1965), since it shows a distinct morphology not only in the adult stage (Alexander, 1955), but also in the larval and pupal stages.

LITERATURE CITED

- ALEXANDER, C. P. 1929. Undescribed species of Eriopterine crane-flies from the United States and Canada (Tipulidae, Diptera). Part I. J. N. Y. Entomol. Soc., 37: 49-50.
1949. Records and descriptions of North American crane-flies (Diptera) Pt. VIII. The Tipuloidea of Washington, I. Amer. Midland Natur., 42: 257-333.
1955. The crane flies of Alaska and the Canadian Northwest (Tipulidae, Diptera). The genus *Erioptera* Meigen. Univ. Mich. Mus. Zool. Misc. Publ., 90: 1-33, figures.
1965. Family Tipulidae. In, Stone, A., *et al.* (ed.) A Catalog of Diptera of America North of Mexico. U. S. Dep. Agr. Handb. No. 276, pp. 16-90.